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OPPORTUNITIES FOR REDUCING THE COST OF FEDERAL OPERATIONS THROUGH GREATER USE OF VALUE ENGINEERING

A REPORT

PREPARED BY THE

SUBCOMMITTEE ON OVERSIGHT OF GOVERNMENT MANAGEMENT

OF THE

COMMITTEE ON GOVERNMENTAL AFFAIRS UNITED STATES SENATE

SEPTEMBER 1987

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LETTER OF TRANSMITTAL

U.S. SENATE,
COMMITTEE ON GOVERNMENTAL AFFAIRS,
SUBCOMMITTEE ON OVERSIGHT
OF GOVERNMENT MANAGEMENT,
Washington, DC, September 15, 1987.

Hon. JOHN GLENN,
Chairman, Committee on Governmental Affairs, U.S. Senate, Dirksen Senate Office Building, Washington, DC.

DEAR MR. CHAIRMAN: The Subcommittee on Oversight of Government Management transmits the following report on the federal government's use of a cost cutting technique known as Value Engineering (VE). Although numerous General Accounting Office and Inspector General reports have been written about various aspects of VE, the Subcommittee's report represents the first attempt to assess the status of VE on a government-wide basis. Over a period of three months of investigation, the Subcommittee surveyed the VE efforts in the three military services and 10 civil agencies. On the basis of this research and a hearing held on April 29, 1987, the Subcommittee found VE to be a useful cost-sharing technique, with potentially dramatic Returns on Investment, which is not being adequately utilized by federal agencies.

Value engineering can be readily applied to almost any item or function—from a production line to a major construction project, as well as to non-hardware areas such as management procedures, computer software, and packaging. It is a process which was first used in the federal government in the 1950s, and is intended to complement other cost cutting measures, not substitute for them.

The Department of Defense (DOD), by virtue of the size of its budget and the nature of its expenditures, is the leader in the use of VE. It is now saving in the neighborhood of $2 billion annually through use of this cost-saving measure. Nevertheless, the Subcommittee found that there is considerable opportunity for increased savings in DOD, and if DOD had met its own goals for the contractor-generated side of its VE program it could have saved an additional sum of almost $2 billion over the past five years.

The story is somewhat different in the civil agencies we reviewed. There, the Subcommittee did not find a single agency-wide VE program. Even the Environmental Protection Agency, the only agency required by law to conduct VE studies, primarily limits its program to legally-mandated studies on wastewater treatment facilities costing in excess of $10 million. Other civil agencies have either no program or a limited program affecting some parts of the agency.

Considering the potential for savings that would stem from a more aggressive and widespread VE program, the Subcommittee has encouraged the Administration to mandate a government-wide VE program. In response, the Office of Management and Budget is recommending establishment of a VE program in each agency, with such features as a central focal point to promote value engineering, funding for value engineering in annual budgets, and the routine documentation of contract files as to why value engineering was not used on projects which meet guidelines to be established by each agency. A copy of the proposed OMB circular containing this proposal is included at the end of this report. It was published in the Federal Register for comment on August 27, 1987.

This program would represent a significant step forward. Implementation of the policies contained in the draft circular will, we believe, lead to a more cost-conscious federal procurement force and to a more efficient expenditure of federal dollars.

Sincerely,

CARL LEVIN, *Chairman.*

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I. INTRODUCTION

The history of Value Engineering (VE) in the federal government has been one of inconsistency and dependence on the whims of individual managers. The government's commitment to VE has waivered, despite the fact that the potential increase in savings from VE could reach billions of dollars.

A. Substantial Benefits Derived From VE at All Levels of Government

Billions of dollars are already being saved by federal agency VE programs, and the potential exists to save billions more. But unless the federal government makes a coordinated effort, these savings will be needlessly lost.

Most of the current savings are in the Department of Defense (DOD), but some civil agencies are also achieving worthwhile VE savings. The DOD savings are shown below:

VE savings by DOD

[In millions of dollars]

Year:	*Total savings*
1981	920.5
1982	1,347.7
1983	1,351.5
1984	1,237.1
1985	2,020.6
1986	2,339.3

The Department of Transportation (DOT) and the Environmental Protection Agency (EPA) have also reported significant VE savings. DOT reported savings of $341 million during just the past three years, including $60 million of savings on a $700,000 investment in 1986. EPA, the only federal agency legislatively mandated to perform VE, saved $381 million for the period 1981–1984 and is currently achieving a return on investment of 34:1. This is up from 12:1 when the program started in 1977. In a statement prepared for a hearing held on April 29, 1987, before the Subcommittee on Oversight of Government Management, an EPA representative stated, "In addition VE frequently results in significant improvements in the quality of projects."

VE's contribution to improvement in the quality of products was demonstrated in a study done for DOD several years ago by the American Ordanance Association (now the American Defene Preparedness Association). The results of this study, shown below, reveal that significant improvements were brought about by VE in areas in addition to cost—such as quality, reliability and performance.

TOTAL VALUE ENGINEERING EFFECTIVENESS
SAMPLE OF 193 IMPLEMENTED CONTRACTOR VE CHANGES DRAWN FROM 2,627 CHANGES

RELIABILITY	ABILITY TO MEET PERFORMANCE REQUIREMENTS FOR A DETERMINED NUMBER OF TIMES.	63% / 37%
MAINTAINABILITY	RELATIVE EASE OF REPAIR OR REPLACEMENT.	64% / 36%
PRODUCIBILITY	RELATIVE EASE OF REPEATABLE MANUFACTURE.	82% / 16%
HUMAN FACTORS	ACCEPTABILITY OF CHANGE RELATED TO NECESSARY EDUCATION OR MANUAL DEXTERITY.	58% / 41%
PARTS AVAILABILITY	RELATIVE EASE IN OBTAINING OR MANUFACTURING SIMPLIFIED OR STANDARDIZED PARTS.	58% / 41%
PRODUCTION LEAD TIME	ELIMINATION, STANDARDIZATION OR SIMPLIFICATION OF OPERATIONS OR MATERIALS.	78% / 21%
QUALITY	CHARACTERISTICS OF PARTS TO CONSISTENTLY MEET EVERYTHING SPECIFIED.	71% / 29%
WEIGHT	LIGHTER IN WEIGHT.	37% / 58% / 4%
LOGISTICS	QUANTITY AND COMPLEXITY OF PARTS NEEDED FOR FIELD SUPPORT OF END ITEMS.	55% / 45%
PERFORMANCE	ABILITY OF THE CHANGE TO CARRY OUT THE EXTENDED FUNCTION AT TIME OF INITIAL TEST OR QUALIFICATION.	33% / 67%
PACKAGING	RELATIVE EASE OF PROTECTING PARTS UNTIL READY FOR USE.	24% / 76%

SOURCE: Total Value Engineering Effectiveness, American Ordnance Association, Washington, D.C. 20006, August 1967, pg. 5 and 6.

ADVANTAGE
NO EFFECT
DISADVANTAGE

Foreign governments and state and local governments also report success with their VE programs. It has been reported, for example, that 17 of the top 20 Japanese industrial corporations have VE executives at the vice presidential level. In testimony before the Subcommittee, Alphonse Dell'Isola, an internationally recognized value engineer, noted that, "there are over two hundred full-time Value Specialists working in the Japanese steel industry and none in the U.S." Mr. Dell'Isola added "This fact could be one of the reasons why the U.S. has lost its competitive edge."

New York City, despite being a relative newcomer to VE, has compiled a remarkable record of VE savings. This city's Office of Management and Budget (NY OMB) administers a $2 billion a year capital program with responsibility for about 2500 construction projects annually.

VE was first used by NY OMB in 1982. By the time of the April 1987 Subcommittee hearing, NY OMB had performed VE studies on 17 projects. Total project costs were over $900 million, and total VE savings were between $114 and $140 million. Other VE recommendations resulted in substantial reductions in future operating costs. This was achieved at a cost of New York City of about $1 million, a return on investment of well over 100:1.

In another example of how VE saves more than dollars, NY OMB reported on a proposed design of a hospital reconstruction in which the VE recommendations resulted in a savings of $24 million. In addition, the value engineers were able to make recommendations which reduced the inconvenience to staff and allowed more of the hospital to operate during construction. More importantly, a NY OMB representative concluded, "Without the VE study, entire

departments included in the hospital modernization might have been eliminated in order to stay within the city's budget."

B. Value Engineering—What Is It?

The concept of VE was developed during World War II when materials were difficult to obtain and the resulting shortages forced the introduction of many substitutes. The use of substitutes at General Electric led to the development and incorporation of VE techniques into the field of product design.

VE is an organized approach to obtain optimum value for every dollar spent. Through a system of investigation and comprehensive analysis, unnecessary expenditures are avoided or eliminated, and the result is improved value and economy. The approach is a creative effort based upon an analysis of functions. It is concerned with the elimination or modification of anything that adds cost to an item but is not necessary to its basic function—that is performance, safety, appearance and/or maintenance. During this process all expenditures relating to procurement, maintenance, and operation and replacement, i.e., the life cycle costs of an item, are considered. Through the use of the latest technical information regarding new materials and methods, alternate solutions are developed for specific functions.

Conventional cost reduction methods are augmented by value engineering. In contrast to simple cost-cutting by making smaller quantities or using less or cheaper materials, an item is analyzed by asking, with a fresh eye, such questions as: What exactly is the item? What must it do? What do the same job? What would the alternative material or method cost? Stated another way, *the question is not how a product or part can be produced more economically, but how the function performed by the product or part can be achieved at the least total cost.* To arrive at the answers to these questions, an organized methodology is used.

A publication issued by EPA [1] cites the following as the most common causes of unnecessary project costs. Addressing these causes is the major task of, and benefit from, VE.

Lack of Time: Schedule constraints preclude the investigation of all design options and the development of cost comparison for multiple design options.

Lack of Information: Since technological changes are occurring at a rapid pace, no designer can be expected to be knowledgeable and up-to-date on all new proucts and techniques.

Lack of a Key Idea: Sometimes an innovative, cost-saving idea is not recognized in time to influence the design.

Lack of Budget: Shortcuts taken to stay on schedule and maintain the design budget frequently minimize the analysis of alternatives which can improve the cost effectiveness of the facility. Even though the design budget is a small part of the total cost of a facility, it can adversely influence the total costs if it is deficient.

Temporary Decisions which became Permanent: Often a temporary decision is made in a particular area of the design to

[1] "Value Engineering For Wastewater Treatment Works" (September, 1984) at 1-2.

maintain progress, but time restraints or other factors do not provide an opportunity for its re-evaluation. When temporary design decisions become permanent, they can have a cost impact on more than the original facility, because they become a standard for future designs.

Habits: Habits promote the use of standard design features because "we've always done it this way." Habit may increase project costs by the use of a design feature which may be outmoded, unnecessary or inappropriate for the current project.

Politics: Political factors and forces are complex and often dictate design features which are not the least-cost alternatives. Pressure from local citizenry may "force" the use of certain design features. Funding constraints may allow first-cost considerations to prevail over life cycle cost considerations. Architectural and esthetic, or other, constraints may be imposed on the project by outside participants."

A VE team can identify substantial cost savings by addressing these factors. The VE team operates as a reviewer, instead of a developer, of the design involved. It is similar to a Monday-morning quarterback who is able to conduct the review of the previous day's game with a detachment and perspective not found in the players and coaches during the heat of the contest.

EXAMPLES OF VALUE ENGINEERING

Examples of the value engineering run the gamut from reasonably simple ideas to very complex proposals requiring considerable engineering and redesign work. There is also a wide range of potential savings to the government. Two examples of value engineering which illustrate these points are shown on the next two pages.

C. Previous Attempts To Improve Government-Wide VE

In 1967 [2] and, again, in 1973,[3] hearings were held before the Senate Public Works Committee on VE. The similarity of the status of VE in those days, as described in the hearings, and its status today is startling. Although some changes have occurred, many of the same issues remain. Savings of hundreds of millions of dollars were being achieved some 15–20 years ago while estimates of potential savings ranged into the billions of dollars; the need for legislation was discussed; the need to improve the VE programs in some agencies and initiate programs in other agencies was urged.

The U.S. General Accounting Office (GAO) has issued numerous reports over the past two decades recommending improvements to various civil and defense agency VE programs. A list of relevant GAO reports is attached. More recently some Inspectors General (IGs) have criticized various agency VE programs as being less comprehensive than desired or requiring improvements in the conduct of the program.

Over a decade ago, in another failed effort, the General Services Administration (GSA) attempted to instill some order and manage-

[2] Hearings before the Committee on Public Works, U.S. Senate (August 1 and 2, 1967).
[3] Hearings before the Subcommittee on Buildings and Grounds of the Committee on Public Works, U.S. Senate (June 18 and 19, 1973).

ment into a government-wide value engineering program. This effort had the admirable objectives of extending the use of VE in those agencies experienced in its application, promoting VE in those agencies without prior experience, and promoting the effective use of VE incentive clauses in contracts made by federal agencies. That effort appears to been caught up in the Office of Management and Budget (OMB) and Congressional dispute regarding moving management functions from OMB to other agencies, and that effort died aborning.

REDESIGN OF FUEL PYLONS

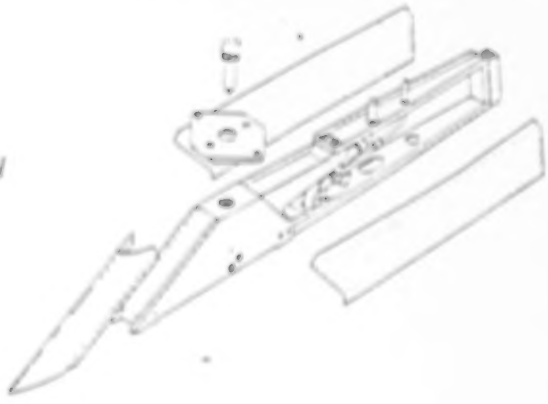
PRIOR TO VECP:

FUEL PYLON ASSEMBLY

PARTS REQUIRED FOR ASSEMBLY = 62

AFTER VECP:

FUEL PYLON ASSEMBLY

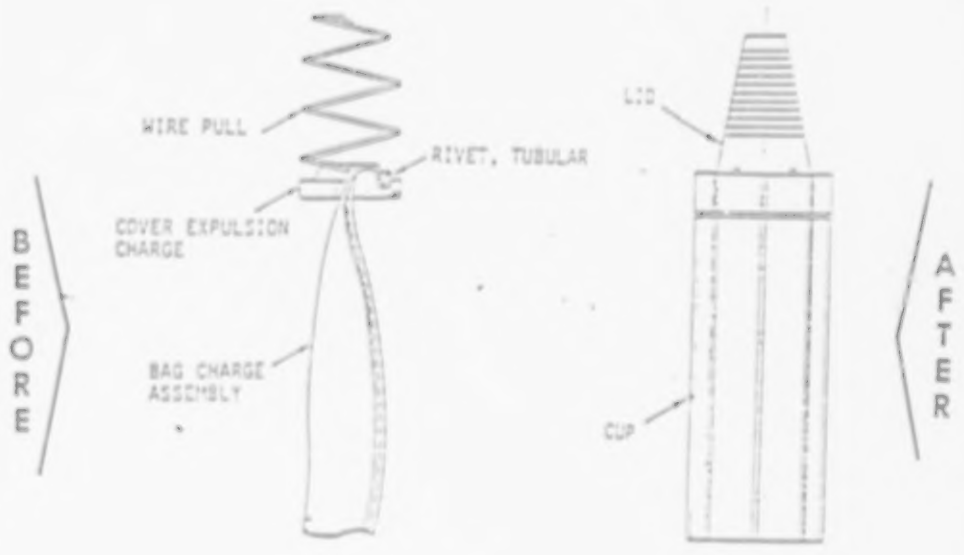


PARTS REQUIRED FOR ASSEMBLY = 24

TOTAL PARTS REDUCED = 38

TOTAL SAVINGS = $20.8 MILLION

PLASTIC EXPULSION CHARGE ASSEMBLY FOR M483A1 - 155MM PROJECTILE



BAG ASSEMBLY $4.52

PLASTIC CUP ASSEMBLY $1.13

UNIT SAVINGS $3.39

3 YEAR SAVINGS FOR THE US ARMY
$4,680,000

Despite its untimely demise, the effort was founded on certain principles still relevant today. These are as follows:

(a) Reductions in cost are frequently possible due to advances in technology, additional information from testing or user feedback, or changes in user requirements.

(b) . . . [VE] represents an intensified examination of a portion (generally 10–20%) of a system, design, service or procedure which represents significant cost. It provides identification of functions, analysis of functions and cost/function relationships, cost targets, and cost visibility to improve the economic efficiency of the use of federal resources.

(c) . . . [VE] should be accomplished as early as possible; i.e., before commitment of funds, approval of systems, services, or designs to maximize savings. [VE]—should also be applied to ongoing programs and projects.

(d) . . . [VE] Use of [VE] contract provisions are necessary to supplement internal [VE] activity. These provisions enable the government to keep abreast of latest technical developments, to gain better insight into actual procurement costs, to provide final opportunity to save before procurement is complete, and to simulate the application of [VE] in the design, technical planning or procurement planning stages, and

(e) . . . [VE] frequently provides benefits other than cost, such as improvements in reliability, maintainability, human factors, performance, fire protection, life safety, energy conservation, quality and ecology."

D. Current Congressional interest

On April 29, 1987, the Senate Subcommittee on Oversight of Government Management held a hearing [4] to explore the opportunities available in the federal sector to apply and benefit from VE, to identify current inadequacies in the VE programs of federal agencies, and to determine what could be done to ensure a more consistent and widespread use of VE in federal programs.

The witnesses at the hearing were:

Mr. Alphonse Dell'Isola, Vice President, Smith, Hinchman and Grylls Associates, Inc. (SH&G);

Mr. John A. Mittino, Deputy Assistant Secretary of Defense for Production Support, accompanied by Mr. Gordon Frank, Director, Industrial Productivity Support Office, Department of Defense; and

Mr. Robert P. Bedell, Administator, Office of Federal Procurement Policy.

In addition, a prepared statement was submitted by Mr. Lawrence J. Jensen, Assistant Administrator for Water, Environmental Protection Agency.

In preparation for the hearing, the Subcommittee surveyed the VE programs of DOD and 10 civil agencies; reviewed relevant GAO and IG reports; and discussed VE with representatives of DOD and the three military services, GSA, New York City, and VE consultants in government and private industry.

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[4] Hearing on "Oversight of Value Engineering Programs in Federal Agencies", Subcommittee on Oversight of Government Management, Committee on Governmental Affairs, U.S. Senate (April 29, 1987).

E. Federal Acquisition Regulations [FAR] Define Two Approaches to VE

There are two types of VE proposals recognized in the FAR: VECPs and VEPs. Contractor-generated proposals are referred to as Value Engineering Change Proposals (VECPs), while proposals generated by a government agency on an in-house basis are called Value Engineering Proposals (VEPs). The FAR defines a VECP as a proposal requiring a change to the instant contract to implement and resulting in cost reduction without impairing essential functions. A VEP is a VE proposal submitted by an agency employee or an agency's VE consultant.

The FAR sets forth two approaches to VE. However, an agency head may exempt the agency from either or both approaches for all contracts or for certain classes of contracts. The first is an incentive approach in which contractor participation is voluntary and the contractor uses its own resources to develop and submit any VE change proposals. This approach provides for a sharing of savings and for payment of the contractor's costs only if the proposal is accepted by the government. Stated another way, with this approach, the contractor assumes all risk for such proposals.

The second approach is a mandatory program in which the government requires and pays for a specific VE effort. The contractor performs VE of the scope and at the level of effort required by the government, and it is included as a separately priced item in the contract. The contractor shares in the savings of accepted proposals but at a reduced rate. The government/contractor shares of net acquisition savings are shown below.

	Incentive (voluntary)		Program Requirement (mandatory)	
TYPE OF CONTRACT	INSTANT	CONCURRENT AND FUTURE	INSTANT	CONCURRENT AND FUTURE
	Gov/Con	Gov/Con	Gov/Con	Gov/Con
Fixed price (other than incentive)	50/50	50/50	75/25	75/25
Incentive (fixed-price or cost)	*	50/50	*	75/25
Cost-reimb. (other than incentive)	**75/25	75/25	85/15	85/15

* Same ratio as the contract's cost incentive ratio.
** Includes cost-plus-award-fee contracts.

The sharing period for savings on procurements of goods and services begins with acceptance of the first changed unit and ends at the later of 3 years or the delivery date for the last item in the instant contract. Savings may be calculated on the instant con-

tract, concurrent contracts (ongoing contracts at the time the proposal is accepted), and future contracts. The contractor's share of the savings may be paid in a lump sum or when the future and concurrent contracts are awarded or modified. In some instances, savings in the areas of operations and maintenance or logistics may also be involved. The latter savings are defined in the FAR as "collateral savings."

II. FINDINGS

The Subcommittee concentrated its efforts on assessing the extent to which VE was used in DOD and 10 civil agencies and attempted to determine the impediments to greater use of VE by contractors. One of the major impediments to greater involvement by contractors is the risk involved in developing VECPs, combined with a general distrust of the Government's commitment to its own VE program.

A. DOD—Major VE Accomplishments, but Potential Exists for Greater Savings

VE was first introduced into DOD through the Navy in the 1950s, although it did not become a DOD program until the early 1960s. Today, the DOE VE program saves in the neighborhood of $2 billion annually. Yet, if it had met its goal for savings from just contractor-generated VE proposals for the five year period 1981–1985 (.7 percent of procurement obligational authority), it would have saved an additional $2 billion.

There is ample opportunity to use VE in DOD, not only in its construction program, but also in its unusually large procurement programs. Unlike most other agencies, DOD contracts for production of items requiring long-term production lines. The benefits of a VE proposal can accrue over the entire life of a weapon system's production line, for example, which can run for several years.

DOD operates both an in-house and contractor-generated VE program and achieves considerable savings from both, as shown in the following chart.

VE SAVINGS BY DOD

[In millions of dollars]

Year	In-house	Contractor	Total
1981	824.6	95.9	920.5
1982	1,203.0	144.7	1,347.7
1983	1,219.0	132.5	1,351.5
1984	953.3	283.8	1,237.1
1985	1,680.7	339.9	2,020.6
1986	1,885.7	453.6	2,339.3

DOD's in-house program involves submission of VE proposals primarily from defense industrial facilities such as maintenance and overhaul facilities and supply facilities. These include Air Logistics Centers, shipyards, and Army depots. In fiscal year 1986, DOD reported that over 7,000 VE in-house proposals were accepted.

Some years ago, DOD established an annual savings goal of .7 percent of procurement Total Obligational Authority for the contractor side of the VE program. This goal has never been met, and DOD's contractor-generated VE savings are much less than its in-house program. One reason is that VE savings are reported as net savings, i.e., net of all costs, which include a contractor's share of the savings. So while all the savings reported by DOD for the in-house effort are savings to the government, savings reported for contractor-generated VE efforts do not, by definition include the contractor's share of the savings.

There is another reason, however, for the shortfall in contractor-generated VE savings. Contractors appear to have been discouraged by the length of time required to approve and implement VE proposals and by arguments over the amount of the actual savings and, therefore, the contractor's share. This problem is discussed at some length in Section C of this report.

1. DOD INSPECTOR GENERAL REPORT ON CONTRACTOR-GENERATED VE PROPOSALS

The DOD IG issued an audit report in December 1985 regarding processing of contractor-generated VECPs. The IG reported two major findings: [5]

(a) Eligible contractors were generally not submitting VECPs to DOD. The 11 Service Plant Representatives Offices reviewed by the IG oversaw 11 contractors with an FY 1984 volume of about $64 billion on 988 DOD contracts containing incentive VE clauses. Only 32 VECPs were submitted, or 3.2 percent of the number of contracts with clauses. The 20 Defense Contract Administration Service (DCAS) offices reviewed by the IG oversaw 3,932 contractors with an FY 1984 volume of $26.9 billion on 15,946 contracts containing VE clauses. Only 497 VECPs were submitted, or 3.1 percent of the number of contracts with the clauses.

(b) Generally, DOD took far longer than the 45 day standard for accepting or rejecting VECPs. It took approximately 78 days to accept VECPs and approximately 87 days to reject them. It took and additional 140 days to implement an accepted VECP.

The IG report states that, although top-level DOD management emphasis has been given to the program throughout the military departments, there has been little substantive improvement at the contracting officer level, where the success of the program is ultimately determined. DOD procurement and contract administration activities usually consider VE to be a low priority task and do not actively promote the program, according to the report. The report also notes that there is a positive correlation between the promotional effort for VE and the VECP productivity of eligible contractors.

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[5] Department of Defense Inspector General Audit Report, "Management of Value Engineering Change Proposals" (December 26, 1985) at 5 and 11.

2. DESPITE APPARENT CONTRACTOR SATISFACTION WITH SHARING ARRANGEMENTS, MOST WEAPON SYSTEMS DO NOT HAVE ANNUAL VECP ACTIVITY

One interesting note from the IG's review of the DOD VECP program was that almost 75% of 183 DCAS-monitored contractors queried believed that the incentive awards for VECPs were adequate. This is consistent with the Subcommittee staff discussions with major weapon systems contractors and DOD VE managers who also maintained that the sharing ratios were adequate.

Nevertheless, one reason DOD is not meeting its goal for the contractor-generated part of its VE program is that the vast majority of the major programs do not have contractor-generated proposals submitted for them in any one year. *In 1977, GAO reported* [6] *that 78 percent of DOD's major weapon systems with acquisition costs of more than $1 billion each did not report any savings from value engineering during 1976. For FY 1982, GAO reported* [7] *that only 18 of 46 major weapon systems reported value engineering savings from the contractor component of the VE program.* DOD data for FY 1985 shows Army reporting VECP savings on 12 of 33 major programs, Navy reporting VECP savings on 14 of 45 major programs, and Air Force reporting savings on only 5 of 37 major programs. In total, only 31 of 115 programs, or just over one fourth of the programs, reported savings from contractor-generated VE proposals in FY 1985.

3. VE IN DOD CONSTRUCTION

The Army Corps of Engineers (Corps) and the Naval Facilities Engineering Command (NAVFAC) are the DOD's construction agents who, together, administer billions of dollars of construction projects annually. In December 1984 the DOD IG reported [8] that, "The full potential savings of the value engineering process were not realized" *and that DOD saw no incentive to reduce the cost of military construction projects if there was adequate project funding.* The IG reported that, while savings of 15 percent or more was reasonable and realistic, only about 2.2 percent was being realized.

The IG pointed out that the Corps and NAVFAC provided only general guidance for selecting projects for VE review, that value engineers were not directed to review all projects to select those most promising with respect to VE, nor were they directed to look at the high cost projects. In addition, the goals for savings were low, with the Corps goal being 2 percent and the NAVFAC goal set at 4 percent.

Most discouraging was the reaction by the Corps and NAVFAC to suggestions for savings. On a DOD-wide basis the IG reported a reluctance to accept proposed VE savings, particularly if sufficient construction funds were available to pay for the facilities. The IG reported that, *"Items that would have been eliminated through*

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[6] "Department of Defense Value Engineering Program Needs Top management Support" (November 16, 1977) at 9.

[7] "Value Engineering Should Be Improved As Part Of The Defense Department's Approach To Reducing Acquisition Cost" (September 27, 1983) at 16.

[8] Department of Defense Inspector General Audit Report, "Inspection Procedures and Value Engineering Studies in the Real Property Construction Program" (December 21, 1984) at 13-20.

value engineering were being constructed because there was no incentive to reduce costs." The IG noted that VE recommendations on Army projects were accepted often because the studies concentrated on those projects where construction funds were short. *On Navy projects, there was a savings of 5.3 percent on projects where there were no funding problems, but a 15 percent savings on projects with funding problems.*

On civil construction projects, the Corps designs the projects, prepares the construction budget, and manages the construction. Even so, the IG reported, ". . . [VE] *recommendations were not accepted if construction funds were available to pay for overdesigned features.*" For example, the IG cited a fully funded $60 million project where the Corps VE personnel recommended a $775,000 VE saving. The recommendation was not accepted by the Corps and further VE efforts on this project were abandoned.

Since the IG report was issued the Corps has increased its savings goals from 2 to 6 percent. In 1985 and 1986, the Corps reported VE savings of about $160 million annually, up from $113 million in 1983 and 1984. The Corps' overall return on investment for 1986 was 34:1. The Corps and the other DOD elements discussed in the IG report have also agreed to document the files and explain why any rejected VE recommendations were not accepted. This should help ensure that such recommendations are not rejected due to funding availability.

B. Value Engineering in the Civil Agencies

Civil agencies do not operate long-term production lines like DOD, but they do spend billions of dollars on large construction projects, such as mail handling facilities, office construction, water treatment facilities, and federal highway projects. Accordingly, the opportunity for significant savings from the application of VE also exists in civil agencies.

Mr. Dell'Isola, an internationally recognized authority on VE, has stated that if a project can be designed it can be VE-evaluated. Nevertheless, based on a Subcommittee survey of 10 civil agencies, VE efforts in these agencies range from incomplete to none. Some agencies reported the existence of a program, but a review by the Subcommittee indicated that these programs existed primarily on paper, not in practice. A summary of the 10 civil agencies' responses to the Subcommittee survey follows.

1. Department of Housing and Urban Development [HUD]

HUD does not have a VE program. It reported that cost reductions were achieved through other programs such as the President's Productivity Program and by the Inspector General. As GAO and others have noted, however, VE complements, rather than replaces, other cost cutting programs.

2. Department of Health and Human Services [HHS]

HHS stated it had little opportunity to use VE, although the Public Health Service uses it to a limited extent, and appropriate contracts over $100,000 contain the FAR voluntary VE clause. HHS does not offer VE training to its employees and does not use con-

trators to perform VE studies. In the past 6 years HHS has accepted 10 contractor-generated VE proposals for a total savings of about $141,000.

While the Subcommittee did not assess the budget of HHS, a department this size should have numerous opportunities to take advantage of VE. DOD, for example, reports that it applies VE to such non-hardware areas as office automation, quality control, and procedures and supplies.

3. U.S. POSTAL SERVICE

The Postal Service does not have a stated policy regarding VE, but says its use is encouraged through planning, budgeting, and expenditure procedures. The Postal Service is not subject to the FAR, but the Postal Contracting Manual contains FAR-like VE clauses for inclusion in contracts over $100,000.

It seems obvious from the Postal Service response that it does not have a VE program. The Subcommittee believes, however, there is opportunity to use VE at the Postal Service, in the equipment and procedures used in mail handling and to reduce the costs associated with construction activities. In 1986, for example, the Postal Service completed 12 major building projects ranging in cost from $10 million to $90 million each. Another 18 projects, ranging in cost from $20 million to $150 million each, were under construction at the end of 1986.

4. NATIONAL AERONAUTICS AND SPACE ADMINISTRATION [NASA]

NASA's FAR Supplement requires the use of the FAR VE construction clause in fixed-price construction contracts over $100,000. NASA contracting officers are also "required to consider" using the voluntary FAR clause in fixed-price hardware contracts over $1 million. NASA could not identify, however, its investment in VE or any savings from a VE program. It reported that it does not use contractors to perform VE, has not provided as much as 8 hours training in VE to its employees during the past five years, and has no full time person assigned to VE.

NASA operates extensive procurement activities and a facilities construction program. A budget summary for 1987 shows construction or modification of 10 projects with a cost ranging from about $2 million to $17 million each. The budget contained numerous other projects costing less than $750,000 each. The Subcommittee believes that the NASA procurement and construction programs provide ample opportunity for the successful application of VE and that significant savings have gone and continue to go unrealized.

5. GENERAL SERVICES ADMINISTRATION [GSA]

GSA reports that it has had a VE program since the early 1970s. The program applies primarily to construction projects and supply items bought on the basis of design specifications.

The GSA program has achieved only $11.5 million in VE savings during the past 6 years from contractors and does not maintain

records regarding in-house savings. In a 1982 GSA-IG report [9] the Commissioner, Public Buildings Service, was advised that a planned audit of the VE program was cancelled because "no viable VE program existed." The IG pointed out some of the benefits of a VE program and recommended that the agency revitalize its program. GSA issued a directive in 1983 to provide guidance for VE within GSA.

The Subcommittee believes that the VE program at GSA should be significantly more active. While GSA's construction budget has been reduced, substantial funds continue to be spent on construction, renovation and alteration of space. New construction for the period 1981-1986 amounted to over half a billion dollars and renovations and alterations amounted to almost $2 billion for the same period. An active VE program could produce significant cost savings.

6. DEPARTMENT OF INTERIOR

Within Interior, only the Bureau of Reclamation has a VE program, established in 1984. For the years 1984-1986 the Bureau reports VE savings of about $7.4 million, nearly all from its in-house program. It has provided training to more than 500 people and requires a VE study as part of every engineering design unless documented justification is provided for not conducting such a study.

While the Bureau has established a VE program, other parts of the agency have not. The 1987 budget submission for the National Parks Service, for example, shows several construction projects and federal lands highway projects costing in the neighborhood of $1 million to $4 million each. The Subcommittee believes that these projects, at a minimum, would benefit significantly from a VE study.

7. DEPARTMENT OF ENERGY [DOE]

DOE provided a fairly complete response to the Subcommittee survey, which was in part as follows:

> The Department of Energy (DOE) has not promulgated a Departmental policy concerning VE programs. The predominant mission activities performed by DOE contractors consist of management and operation of nuclear weapon production facilities and research and development activities on the cutting edge of defense and energy technologies. VE precepts do not lend themselves easily to procurements involved with these activities especially in DOE's present mode in which production schedules have been dramatically accelerated. For construction, however, various DOE field organizations have developed VE programs to suit the type of contractual arrangement they have with their management and operating contractors. The DOE, at the Headquarters level, has not promulgated policy for VE in construction because accountability for design and construction is decentralized to its field organi-

[9] "Letter Report on Regional Design and Construction Value Engineering Program" (4E-20559-04-04) December 29, 1982, at 1.

zations. Some DOE field organizations have initiated VE activities in construction programs while others have not. Field organizations are encouraged to utilize VE in their design and construction programs where there may be a return on the investment.

DOE further commented that for its three field activities which had a VE program, "both VE consultants and operating contractors perform VE studies. VE consultants and universities have been contracted to provide certified VE training and management briefings. For other DOE field organizations, functional analysis review or similar VE techniques are performed by cooperating contractors in the normal course of design and construction to a greater or lesser degree."

The DOE VE program shows signs of improvement during the past few years, but more could and should be done. For example, the Subcommittee is not convinced that management and operation of nuclear weapon production facilities are inherently outside the scope of matters which would benefit from VE studies. Nor is the Subcommittee persuaded that the headquarters of a decentralized organization might not benefit from VE studies. Also, DOE headquarters should consider an agency-wide directive to require, rather than encourage, establishment of an active VE program in those field offices without one. DOE invested an average of about $122,000 in VE in the 1983-1986 timeframe, yet enjoyed a total VE savings of about $22 million. Also, DOE trained about 60 employees in either 24 or 40 hour VE workshops. The potential for continued savings could and should be realized.

8. VETERANS ADMINISTRATION [VA]

The VA reports an active VE program at the headquarters level, using both in-house staff and VE consultants. VA field stations, which also award design and construction contracts, have not, however, established a formal VE program. VA expects this situation to change in the near future.

Appropriated funds for construction in VA during 1981-1986 ranged from $370 million in 1981 to $812 million in 1983, with $580 million appropriated in 1986. With one exception, VA has invested in excess of $300,000 annually in VE in the past six years and achieved savings ranging from $3 million to $18 million annually.

VA includes the voluntary FAR clause in all construction contracts over $100,000. It also awards grants to States for construction of nursing homes. The grants account for between 60 and 65 per cent of the construction cost, but do not contain VE provisions. VA is currently reviewing nursing home construction standards and is considering inclusion of a requirement for VE.

The Subcommittee believes the commendable results from the existing VA value engineering program demonstrate the potential for even greater savings if the program is expanded Immediate opportunities for expansion include the field offices which award design and construction contracts as well as the grants program.

9. DEPARTMENT OF TRANSPORTATION [DOT]

DOT reports use of VE in three of its components—the Federal Highway Administration (FHWA), the Coast Guard, and the Urban Mass Transportation Administration (UMTA). Three other components—Federal Aviation Administration, Maritime Administration and the St. Lawrence Seaway—use VE only to a limited extent. At the time of the Subcommittee survey, DOT was drafting an order designed to implement a more systemmatic VE process and to capture data on the results of VE studies. When issued, the order would require implementing instructions by each of the DOT administrations.

DOT reports a 1986 VE investment of about $700,000 and a remarkable savings of about $60 million (a Return on Investment of about 86:1), of which approximately two-thirds derives from FHWA. The 1986 FHWA savings are less than some previous years where VE savings exceeded $100 million. The number of people trained in VE annually ranges from about 150 up to as many as 700, with the vast majority being state and local participants in FHWA training programs. Grants from UMTA and FHWA totaled about $15.8 billion with about $14 billion of that from the Highway Administration. The FHWA does not require VE in its grants, but states are encouraged to use VE through a variety of means, including workshops and VE conferences.

The DOT IG has also been active in the VE area, issuing five reports from 1984 to 1987. An August 19, 1985, report [10] on the 1983–1984 VE efforts of the FHWA Federal-Aid Construction projects estimates that state VE programs are saving about $100 million annually. It also estimates that if all states had a VE program, another $150 million could be saved annually, of which the federal share would be $125 million.

The IG also points out that, despite efforts by the FHWA to encourage states to use VE, only an estimated 20 states have active VE programs. Accordingly, the IG recommended a required VE program on all Federal-aid projects. FHWA officials did not concur, however. Indeed, the draft DOT order on VE states only that, "All DOT grant awards . . . should encourage the use of VE in the planning and/or design phase."

A March 12, 1987, IG report [11] on one region of UMTA states that grantees are not applying the VE program to many UMTA funded projects, resulting in a loss of $6.6 million on recently constructed operation and maintenance facilities. The IG report points out that in 1983, an (unidentified) Congressional committee directed UMTA to apply value engineering to federally funded transit construction projects with a total estimated cost of over $150 million. UMTA subsequently issued a policy statement to this effect and also encouraged the use of VE on all construction projects.

The IG reports that VE was used on two large projects reviewed, but was routinely not used on smaller projects. The IG report illustrates the significance of performing VE on smaller projects by

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[10] "Report on the Application of Value Engineering to Federal-Aid Construction Projects in the Federal Highway Administration" Report No. AS-FH-56-038 (August 19, 1985).

[11] "Report on Audit of UMTA Value Engineering", Report No. R9-UM-7-053, March 12, 1987.

showing that VE savings of $1 million and $3 million were achieved on projects with estimated costs of only $8.3 million and $21.4 million respectively.

DOT is operating a worthwhile VE program in some areas. However, the Subcommittee believes the program should be expanded into additional areas, such as the FAA. Also, the IG has identified areas of potential savings in the Federal-aid construction program which should be pursued by DOT.

10. ENVIRONMENTAL PROTECTION AGENCY [EPA]

EPA's VE program applies to all grant projects with an estimated construction cost of $10 million or more. Currently, the only projects involved are those in the construction grant program for municipal wastewater treatment facilities and to a small extent, the Superfund. Net savings for 1981–1984 ranged from $64 million annually to $143 million. This represents a return on investment of from 16:1 to 34:1. Data is not available for 1985–1986. All savings were contractor-generated. VE goals have not been established by EPA; there are no full-time people in the program; and there is no in-house VE program, although from 10 to 67 people receive VE training.

As early as 1974, EPA began its VE efforts by encouraging communities to use VE on a voluntary basis. Encouraged by the success of these efforts, EPA mandated VE for all wastewater treatment plants costing over $10 million. In December 1981, these requirements were codified in the Municipal Wastewater Construction Grants Amendments of 1981 (Public Law 97–117). To date, this is the only legislatively mandated federal VE program.

a. EPA audit report on VE

The EPA IG issued an audit report [12] on September 29, 1986, on one EPA region's VE program in which it was stated that, "Neither the Region, nor its delegated state agencies, have devoted sufficient attention to the Region's VE program to assure that studies were performed when required, were performed in a timely manner, or were adequately documented. Also, many of the justifications for rejecting the VE recommendations were either incomplete or inadequately documented." The report also noted that less than 30 percent of the recommended VE savings were realized during the period 1981–1985. In addition, the report said, the Region did not monitor or actively encourage the use of VE concepts on projects with estimated costs under $10 million. Only one VE study had been performed in the audited Region on these smaller projects during the past five years.

b. GAO report on EPA VE of wastewater treatment projects

On July 16, 1985, GAO reported [13] that VE was seldom used on EPA construction grants with estimated costs below $10 million be-

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[12] "Final Report on Audit of EPA Region 9 Management of Value Engineering Activities Under the Construction Grants Program", Audit Report No. E1C36-09-0069-61562 (September 29, 1986).

[13] "Greater Use of Value Engineering Has the Potential to Save Millions on Wastewater Treatment Plants" (July 16, 1985).

cause there was no federal or state requirement to do so. GAO estimated that extending the use of VE to projects costing between $1 million and $10 million could potentially save between $25 million and $57 million in federal funds annually. EPA rejected this recommendation.

However, in a prepared statement for the April 29, 1987, hearing, EPA stated that there were a number of reasons for lowering the limits for mandatory VE to $5 million, although some lower return on investment would have to be expected. EPA noted that a $5 million limit ". . . would produce both significant savings and significant improvement in project quality, while requiring a manageable increase in the workload required. . . ." EPA also pointed out that it had initiated a program to encourage voluntary VE on projects costing less than $10 million. The Subcommittee was advised, however, that EPA does not intend to mandate VE for projects costing less than $10 million.

The GAO and IG have identified areas where improvement could be made in the EPA VE program. Also, EPA has acknowledged that it is not performing VE on projects where significant savings and improvement in project quality could be expected. The Subcommittee believes EPA should move rapidly to take advantage of these opportunities. As noted later in this report, delays in implementing VE proposals waste scarce Federal resources.

C. Impediments to Contractor Participation in VE

The Subcommittee identified several impediments to greater participation in the VE program by contractors. They include the existence of other investment opportunities for the contractor, the time required to process VE proposals, and the lack of government funding to implement proposals. Another impediment for some contractors is the perception that the government is not seriously interested in the VE program. This perception, in turn, leads to a cautious or reluctant attitude on the part of contractors.

1. Distrust of government's commitment to VE

The lack of contractor participation in VE activity was discussed at the Subcommittee hearing. The witnesses mentioned, as a factor, contractor uncertainty about getting VE proposals accepted by the government, even though the contractor had spent considerable time and money to develop such proposals. Robert Bedell, Administrator of OFPP, noted that since about only half of the contractor-generated proposals are accepted and the cost associated with the rejected proposals continues to be unallowable, then a contractor cannot be certain that an investment in VE will result in savings for the contractor. Senior company officials may justifiably believe, Mr. Bedell said, that they can get greater returns in other areas.

In a letter to the Subcommittee, the American Consulting Engineers Council (ACEC) echoed this concern. The Council wrote, "Given the fact that contractors cannot recover the cost of any VE efforts not accepted by the government, and given that less than half of those VE proposals are in fact accepted—it is not hard to see why VE efforts are not voluntarily done on many contracts."

DOD currently has under consideration a proposal to make the costs of rejected VECPs allowable under certain conditions.

Mr. Dell'Isola, noting that contractors were generally motivated by money, testified in a similar vein, saying that he believed the share ratios were adequate but that contractors were just uncomfortable with investing their money in a program where they aren't guaranteed "a fair shake." He added that if contractors could see an active in-house program in the agency, their attitudes might change. In a March 26, 1986, memorandum the Deputy Secretary of Defense, William H. Taft IV, also commented on the reluctance of contractors to submit VECPs. He noted the "significant untapped potential" and concluded that, "because the voluntary clause requires the contractor to fund a proposal to a potentially unreceptive customer, contractors rarely devote sufficient resources to VE."

These "potentially unreceptive customers" were also the subject of a statement in a 1979 letter to the Chairman of the Senate Committee on the Budget, from former Comptroller General Elmer Staats when he wrote: [14]

> . . . Nothing is more essential to the success of a value engineering program than sustained, highly visible interest, support, and promotion by top-level department and agency management. Unfortunately, that support is sometimes difficult to obtain. Much depends on the background and depth of cost concern of the people involved and their willingness to accept the implied criticism of a proposition that says they could be doing more than they have done to control costs.

Further demonstrating the degree of distrust between the Government and some contractors over the contractor VE program, one military service described the relationship in these terms:

—contractors believe the government is not interested in VE proposals;
—contractors believe it takes too long for approval of proposals and much too long for financial settlement;
—contractors believe the government is not consistent from one organization to another on how it deals with proposals;
—contractors believe the government will steal their ideas;
—government personnel believe that the contractor "should be doing this anyway"; and
—government personnel don't like "paying the contractor for doing less.

The Subcommittee agrees with the witnesses that the attitudes of contractors toward VE might change if they could see an active government in-house program. The Subcommittee also believes that implementation of a government-wide VE program as recommended in this report would allay contractor doubts regarding the government's commitment to VE.

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[14] GAO Report No. B-165767, February 5, 1979.

2. LACK OF UP-FRONT FUNDS

The lack of funds necessary for the government to review and test or analyze VECPs can impede processing. While the DOD policy requires adequate budgeting for value engineering, the budget process does not always allow for this. If funds are not available, the VECP can be rejected or slipped to a later year, either of which may reduce the savings to the government. Mr. Dell'Isola cited an example of the problem caused by a lack of up-front funds during the Subcommittee hearing. He cited a case where he had identified savings of $50 million on a $200 million construction project. However, to realize the savings, there would have to be a redesign of the building costing $500,000. If this up-front money was not made available, the entire $50 million saving would "go down the drain."

In addition to VE savings achieved in the initial procurement of items or construction of a building, the FAR also recognizes savings in the area of operation and maintenance costs, or collateral savings. Collateral savings may also, however, present an up-front funding problem. For example, VECPs developed during the design or early acquisition stages of a project may result in operation and maintenance savings some years downstream. But, at this early stage of acquisition, operation and maintenance budgets may be limited or nonexistent. Therefore, while the FAR generally provides a contractor incentive of 20 per cent of a typical year's collateral savings, the amount of the incentive is actually controlled by the amount available in the acquisition budget for such payments, which may be significantly less than the 20 per cent incentive. Moreover, acquisition managers for the government have little incentive to spend their limited funds to obtain savings in operation and maintenance budgets they do not manage.

During the April 29, 1987, hearing on VE, Mr. Mittino testified that DOD was moving toward making changes in the funding of VE. He noted that ". . . a forthcoming change to the treatment of Defense budget guidance manual will state that change order reserves budgeted in the procurement title are available for value engineering as well as other changes." Funding of engineering change orders is a traditional budget expense, and the new guidance will allow the military services to include VE funds in the budget line items for engineering change orders. Mr. Mittino also noted that the Army had provided an additional $10 million in VE funds in FY 1984 and 1985 and had achieved an increase in the number of contracts with mandatory VE clauses from 137 in 1984 to 575 in 1986. These are encouraging developments. The Subcommittee has been advised, however, that these funds may be reduced or eliminated in future budgets.

3. LIMITED SUBCONTRACTOR INCENTIVES

The FAR requires a contractor to include a VE clause in subcontracts of $100,000 or more but places limitations on subcontractor incentives. For example, the prime contractor may agree to pass through all savings on the current contract, inlcuding the Government's share, on accepted proposals originating with the subcontractor. However, the Government's share of the savings from

future and concurrent contracts cannot be reduced by any agreement between the prime contractor and the subcontractor. In other words, the subcontractor's share of future and concurrent contract savings is limited to some fraction of the prime contractor's share.

As subcontractors continue to receive an increasing share of the federal procurement dollar, the need to obtain their involvement in VE takes on more significance. DOD has stated its intent to work with the civil agencies in an effort to allow a larger share of the savings to the subcontractor and, thus, increase a subcontractor's incentive to participate in the VE program.

4. SLOW PROCESSING AND IMPLEMENTATION OF VECP'S

According to FAR Part 48, DOD components are to provide decisions regarding the acceptance or rejection of VECPs within 45 days of the date of receipt. As noted earlier, the DOD-IG has reported that it is taking DOD about 7 months to process and implement a VECP. As a result of the prolonged processing time by the procurement activities, DOD was not able to maximize savings. The IG audit projected that approximately $3.1 million was lost due to excessive VECP processing time.

The IG noted that the timeliness of processing VECPs has a direct quantifiable impact on potential savings. Untimely processing can lead to lost savings to both the government and the contractor. These lost savings can be calculated. However, additional lost savings that cannot be calculated are those that result from contractors being discouraged from participating in the VECP program. Delayed responses to submitted VECPs may result in a contractor's reluctance to submit future proposals and, therefore, negate potential cost savings.

The length of time for the government to respond to a VE contractor proposal has been noted as one of the most often cited impediments to that part of the VE program. At the same time some contractors may have unrealistic expectations. Complex proposals may require extensive analysis by the Government to ensure that there has been no inadvertent degradation of some less obvious, but nonetheless important, mission characteristic. Reportedly, contractors have stated publicly that more than 200 days are required for them to submit a VE proposal to the government after it has been approved technically in their company.

Forty-five days to assess the safety and performance of some production items may not always be a realistic goal. It is realistic, however, to expect the government to acknowledge receipt of a proposal within 45 days and to give an estimated date for completing its assessment.

III. CONCLUSIONS

In 1979, Comptroller General Elmer Staats told the Chairman of the Senate Committee on the Budget that he seriously doubted that anything approaching the full potential of value engineering can be achieved on existing or new value engineering programs in federal agencies without the influence of Congress.[15] Mr. Staats

[15] Ibid.

also noted that he tended to feel that "some sort of an executive branch overseer, apart from the agencies, would be desirable from the standpoint of maintaining unbiased accountability, and a reasonable degree of uniformity particularly at the procedural and paperwork interface with contractors. The Office of Management and Budget would seem a logical choice."

The Subcommittee believes that the situation described by Mr. Staats eight years ago is basically unchanged today. It concludes that, without some greater impetus than currently exists, VE by federal agencies will not achieve the desired level and consistency of operation.

The Subcommittee further concludes that:

1. Value engineering is a proven cost-cutting methodology that has been applied successfully in the private sector and by federal, state and local agencies.

2. In addition to providing cost savings, value engineering frequently provides improvements in reliability, performance, and quality.

3. Increased appreciation for and application of value engineering would be economically beneficial to executive agencies.

4. Greater encouragement is needed for the federal government to promote the discipline and increase training of value engineering managers.

IV. RECOMMENDATIONS

The Subcommittee recommends that OMB institute and oversee a Government-wide VE program that requires each Executive agency to estalish a value engineering program which will, at a minimum:

A. Emphasize the potential of value engineering to reduce unnecessary cost.

B. Establish a focal point within the agency to monitor and manage the agency value engineering program.

C. Ensure that funds for operating value engineering programs are included in agency budget requests.

D. Establish criteria and guidelines for screening programs and projects for susceptibility to value engineering.

E. Establish guidelines to evaluate value engineering proposals.

F. Consider the number of value engineering change proposals and the manner in which the proposals were processed in evaluating the performance of project and program managers.

Further, Federal Procurement offices shall:

A. Actively elicit VECPs from contractors.

B. Promote value engineering through seminars, meetings, and dissemination of informational literature.

C. Consider the number of value engineering proposals and the manner in which the proposals were processed in evaluating the performance of contracting officers.

D. Establish guidelines for processing value engineering change proposals and require that files be documented for all change proposals requiring more than 45 days to accept or reject.

E. Document all contract files to explain the rationale for accepting or rejecting value engineering change proposals.

F. Document all contract files to explain why value engineering studies were not performed or required for projects or programs meeting the criteria established by the agency for such purposes.

G. Use the mandatory value engineering clause in all initial production contracts for major systems acquisition programs, except where the contracting officer determines and documents the file to reflect that such use is not appropriate.

V. ATTACHMENTS

ATTACHMENT 1

LIST OF MOST RELEVANT GAO REPORTS REGARDING VALUE ENGINEERING

1969—"Opportunities for increased savings by improving management of Value Engineering (design or manufacture simplification) performed by contractors."

1970—A letter report regarding greater use of VE by Coast Guard.

1972—"Value Engineering Program needs to be improved and reinstated."

1974—"Need for increased use of Value Engineering, a proven cost-savings technique, in Federal construction."

1975—"Potential of value analysis for reducing waste treatment plant costs."

1977—"Department of Defense Value Engineering Program needs top management support."

1979—Report to chairman, Senate Budget Committee.

1982—"Value Engineering has the potential to reduce mass transit construction costs."

1982—Department of Interior—"potential exists to reduce construction costs through more effective promotion of the Value Engineering Incentive Program."

1983—"Water resource construction cost could be reduced if Value Engineering were applied to more designs and applied earlier in the design process."

1983—"UMTA could take steps to reduce costs in the development of light rail projects."

1983—"Improvements needed in the Army's design process for military construction projects in Europe."

1983—"Improvements needed in the Air Force's design process for military construction projects in Europe."

1983—"Value Engineering should be improved as part of the Defense Department's approach to reducing acquisition costs."

1984—"Greater use of value engineering has the potential to save the Dept. of Transportation millions in construction cost."

1985—"Greater use of Value Engineering has the potential to save millions on wastewater treatment projects."

ATTACHMENT 2

DRAFT—CIRCULAR NO. A–12X

September 1, 1987.
Subject: Value Engineering.
To the Heads of Executive Departments and Establishments:

1. *Purpose.*—The purpose of this Circular is to emphasize value engineering as a methodology for identifying and reducing nonessential procurement and program cost. The Circular requires agency heads to establish value engineering programs.

2. *Background.*—Value engineering is a technique used by some Federal contractors and Government activities to identify and propose changes to the product, service or process specifications used in Government contracts. The proposed changes are intended to lower the Government's cost for the goods and services being acquired and, at the same time, maintain required quality levels. Over the last several years, reports issued by the General Accounting Office (GAO) and Inspectors General (IG) have consistently concluded that wider use of value engineering would result in substantial savings. While some agencies have programs in-place, others have not utilized value engineering. Even for agencies with established programs, the GAO and IG reports conclude the much more can and should be done to realize the benefits of value engineering. The inhibitors frequently noted in the various reports that prevent a broader use of value engineering include:

—Failure of top management to allocate necessary resources, both in effort and in funds, to establish value engineering programs;
—Absence of criteria for selecting projects and programs for value engineering studies;
—Failure to properly perform value engineering studies;
—Inadequate attention to reviewing and implementing recommendations made in value engineering studies.

Many of the problems noted in the GAO and IG reports are, in part, attitudinal in nature. A common theme in the reports is that there are few incentives to use value engineering or other cost cutting techniques to save money on fully funded programs and projects. This situation cannot continue. Programs should be developed, reviewed and administered in the most cost effective manner possible. Value engineering and other management techniques must be properly used to ensure realistic project budgets and to identify and remove unnecessary capital and operating costs.

3. *Definitions.*

a. *Agency.*—As used in this Circular, agency means any department or independent establishment of the Executive Branch of the Federal Government.

b. *Value Engineering.*—An organized effort directed by a person trained in value engineering techniques to analyze the functions of systems, equipment, facilities, services, and supplies for the purpose of achieving the essential functions at the lowest life cycle cost consistent with required performance and reliability.

c. *Value Engineering Change Proposal (VECP).*—A change proposal submitted by a contractor under a value engineering incentive clause included in a contract.

d. *Value Engineering Proposal.*—A specific program or contract change developed by in-house value engineering personnel employed by the agency administering the contract or program.

4. *Policy.*—Agencies shall establish and use value engineering, where appropriate, to reduce nonessential costs and improve productivity. Individual agency programs shall, as a minimum, provide for the following management and procurement practices.

a. *Management Practices.*—Value engineering programs must be tailored to the mission and organizational structure of individual agencies. Cost and program/project size are general indicators of the potential for value engineering. In most agencies, a relatively few programs or projects comprise the majority of costs. Value engineering efforts should be concentrated on those selected programs. In establishing and implementing value engineering programs agencies shall:

(1) Emphasize, in training and through other programs, the potential of value engineering to reduce unnecessary cost.

(2) Establish a focal point within the agency to monitor, manage and maintain data on agency value engineering programs. This function may be performed either on a full time or collateral basis. Value engineering training shall be provided to the person responsible for the value engineering function. Specific value engineering studies shall, where cost effective, be performed by contract.

(3) Ensure that funds necessary for operating agency value engineering programs are included in annual budget requests.

(4) Establish criteria and guidelines for screening programs and projects for susceptibility to value engineering studies.

(5) Establish guidelines to evaluate value engineering proposals.

(6) Establish procedures for providing recognition and awards to individuals and organizational components that achieve exceptional value engineering savings.

(7) Consider the number of value engineering change proposals and the manner in which the proposals were processed in evaluating the performance of project and program managers.

b. *Procurement Practices.*—President procurement policy on the use of value engineering is set forth in Part 48 of the Federal Acquisition Regulation (FAR). Part 48 provides two basic approaches for using value engineering. The first is an incentive approach in which contractor participation is voluntary and the contractor uses its resources to develop and submit VECPs. A contract clause provides that when a VECP is accepted any savings resulting therefrom are shared with the contractor on a preestablished—usually a percentage—basis set forth in the contract. In the second approach, the Government requires in the contract—and pays the contractor to conduct—a specific value engineering effort, i.e., an effort to identify and submit to the Government methods for performing more economically. This effort generally is directed at the major cost items of a system or project.

The FAR presently permits agency heads to exempt their agencies from using value engineering provisions in contracts. That exemption is hereby removed and the FAR will be modified to require that contracting activities include value engineering provisions in contracts except where exemptions are granted on a case-by-case basis or for specific classes of contracts. One time agency-wide exemptions will no longer be permitted. In addition, agency contracting activities will:

(1) Actively elicit VECPs from contractors.

(2) Promote value engineering through contractor seminars, meetings and the dissemination of promotional and informational literature regarding the value engineering provisions of contracts.

(3) Consider the number of value engineering change proposals and the manner in which the proposals were processed in evaluating the performance of contracting officers.

(4) Establish guidelines for processing value engineering change proposals and require that files be documented for all change proposals requiring more than 45 days to accept or reject.

(5) Document all contract files to explain the rationale for accepting or rejecting value engineering change proposals.

(6) Document all contract files to explain why value engineering studies were not performed or required for projects or programs meeting the criteria in paragraph 4a.(4) above.

(7) Use the value engineering program requirement clause (FAR 52.248-1 alternatives I or II) in all initial production contracts for major systems acquisition programs, except where the contracting officer determines and documents the file to reflect that such use is not appropriate (See Section 102(10)(b) of Public Law 98-577 for a definition of major systems).

5. *Sunset Review.*—The policies contained in this Circular will be reviewed by the Office of Management and Budget three years from the date of issuance.

6. *Inquiries.*—Further information about this Circular may be obtained by contacting the Office of Federal Procurement Policy, 726 Jackson Place, NW, Washington, DC 20503, Telephone (202) 395-6803.

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Director.

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